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CONSIDERATION OF THE DRAFT INTERNATIONAL CONVENTION FOR THE CONTROL AND MANAGEMENT OF SHIPS' BALLAST WATER AND SEDIMENTS

Ballast Water Discharge Standards - Regulation D-2

Submitted by the United States

SUMMARY

Executive summary:	This paper details the rationale for protective ballast water discharge standards and makes specific recommendations for values for the standards as shown in the annex to this paper. The United States also expresses support for the Convention provision for existing systems for ballast water treatment.
Action to be taken:	Paragraph 13
Related documents:	BWM/CONF/2, MEPC 49/2/21, MEPC 48/INF.16, MEPC 49/INF.31

Introduction

1 The effectiveness of this Convention rests in large part on the selection of biologically protective ballast water discharge standards. The United States offers its views on specific ballast water discharge standards. The text that results from these recommendations is shown in the annex to this paper.

Background

2 The construct of ballast water treatment standards has evolved significantly in the past two years of negotiations. Understanding the implications of selecting concentrations and sizes of organisms requires understanding of a number of issues including the size ranges of organisms, concentrations of organisms in nature, concentrations of organisms in ballast water at discharge, the practicality of detecting specific low concentrations of organisms, and the technological ability to manage ballast water to achieve low concentrations of organisms. Where there is not a well developed empirical body of science on which to base specific recommendations, the United States believes it appropriate to take a conservative approach with the goal of significantly reducing the risk of ballast water mediated introductions of harmful aquatic organisms.

3 Concern has been expressed, at a number of sessions of the Marine Environment Protection Committee, that setting the ballast water discharge standards at very low

concentrations will result in a Convention that is not feasible to implement in a reasonable period of time. While it is true that treatment technologies remain in their infancy and comparatively few technologies have been installed and rigorously tested on ships, the United States believes this situation should not prevent the Conference from agreeing to biologically protective standards to take effect at certain dates in the future. There are a number of arguments in favor of this approach. First, we share the widespread belief that the establishment of a challenging standard is necessary to encourage the development of technologies and management practices to meet that standard. Investment is encouraged and research and development efforts are well justified by a clear target. Secondly, the Convention currently contains a review provision that will require an assessment of the development of technologies, for treatment and detection, to determine if the provisions of the Convention remain reasonable or if an adjustment needs to be made. This review is currently set to occur 3 years prior to the implementation date of the discharge standards. At that time, there will be an opportunity to carefully evaluate whether the implementation date or the specific standards require adjustment. We encourage the Conference not to settle for standards simply because they can be accomplished using existing or soon-to-be-available technology. Instead, the Conference should set environmentally sound, biologically protective and enforceable standards that allow innovation, adaptation and inspiration to be focused through intense technology development. The ballast water standards we are discussing are to be phased in over a decade.

Concentration based

4 The United States strongly supports ballast water discharge standards expressed as concentrations of organisms not to be exceeded in discharged ballast water, as currently framed in Regulation D-2. This approach allows consideration of both the level of protection required to reduce the risk of invasion, as well as technical issues such as detection limits.

Organisms greater than a certain size

5 Expressing the standard as concentrations for specific size groups reflects consideration of the expected capabilities of technology as well as protection. In this regard, it is wise to set the initial size criterion at a level that will challenge the development of technology. The United States has sponsored several workshops focused on collecting information and generating discussion of the ballast water discharge standards. While it has been generally agreed at these sessions that technologies capable of treating ballast water are in the initial stages of development, it was agreed by technology experts in attendance at the most recent workshop that a size cut-off of 50 microns would be practicable in the near term (MEPC 49/INF.31).

6 The size categories now in the draft treaty were chosen by scientists at MEPC 49 to roughly separate organisms in ballast water into macrozooplankton and nekton, auto- and heterotrophic protists, and bacteria. The following discussion elaborates on these categories.

Macrozooplankton and nekton

7 The concentration alternatives in the draft Convention text are $1/m^3$ and $100/m^3$. It is critical to note that $100/m^3$ represents the most frequent observed number of organisms in unmanaged ballast water as reported by ICES (MEPC 49/2/21). Thus, this $100/m^3$ discharge standard presents no real reduction in risk of introduction. For this reason, the United States suggests this option be discarded. The Conference should instead focus on whether or not the $1/m^3$ standard represents an adequate reduction in invasion risk or if a lower concentration should be recommended. Several international workshops have carefully considered this question.

Experts attending two of these workshops (MEPC 49/2/21 and MEPC 49/INF.31), some from outside the United States, recommended less than 0.4/m^3 and 0.01/m^3. In context, these values represent reductions of 3 and 4 orders of magnitude respectively in the numbers of organisms found most frequently in unmanaged ballast water. While a 4 order of magnitude reduction may seem a significant reduction in the number or organisms, it is important to reflect on the number of organisms that may remain in ballast water under these conditions. For example, if the ICES figure of an average of 4.6/l is used, a vessel with 10,000 m^3 of ballast water would discharge 46,000,000 zooplankton. This vessel would actually be carrying 4,600 zooplankton/m^3, and in the absence of treatment would discharge a total of 46,000,000 zooplankton. Even if treated to reduce the concentration by 4 orders of magnitude, this single vessel would still potentially discharge 4,600 living organisms into a harbour or estuary. Given that many ports and estuaries receive multiple vessel visits from the same regions over the course of days and weeks, the cumulative number of organisms introduced will be quite a bit larger. For these reasons the United States urges the Conference to adopt less than 0.01/m^3 as the concentration standard for zooplankton.

8 With respect to the cut-off size for these organisms, 80 microns and 50 microns are each in brackets having been recommended for consideration. Scientists in the United States have advised that the 50-micron size cut-off is essential to address important organisms. In MEPC 48/INF/16, the United States provided a discussion of the size distribution of aquatic organisms. From this distribution, it can be seen that the cut-off of 50 microns would include almost all of the taxa commonly considered to be macrozooplankton and that those organisms smaller than 50 microns are mostly protists and bacteria. Further, the use of 50 micron nets, along with 80 micron nets, in the sampling practices represented by the ICES paper indicates there is good scientific reason to consider 50 microns a necessary cut-off to adequately address macrozooplankton and nekton entrained in ballast water. For these reasons, the United States urges the Conference to adopt a cut-off size of 50 microns.

Protists (including phytoplankton)

9 The Convention as drafted following MEPC 49 contains three proposed maximum concentrations for these organisms: Less than 1/ml, 10/ml and 100/ml. The 10/ml option is of the same order of magnitude as the median concentration of phytoplankton found in *unmanaged* ballast water as reflected by the ICES submission to MEPC (49/2/21). The United States supports discarding 10/ml and 100/ml in the discussion of potential standards because they represent no real reduction in the risk of ballast mediated introductions of these organisms. The discussion of the invasion potential of these organisms is quite different from that for organisms larger than 50 microns. Protists broadly have the ability to reproduce asexually, thus there is the potential for one propagule, one organism, to establish a population. This circumstance argues for very low concentrations. For these reasons, the United States proposes the standard for protists less than 0.01/ml.

Microbial Organisms

10 The United States strongly supports the use of a suite of indicator taxa and that the standard for each should be set at a certain concentration. We also strongly support language in the draft treaty text which emphasizes the list of indicators is intended to be non-exclusive, thus allowing for the use of additional indicators when necessary. The current draft standard for microbial organisms lists both *E. Coli* and *Enteroccoci* because of their implications for human health. While these are indeed important organisms, the concentrations listed are less protective to human health than those recommended in United States sponsored workshops attended by

concerned scientist from a variety of fields. We are recommending 33 cfu/100ml for *Enteroccoci* and 126 cfu/100ml for *E. Coli*. The United States believes ballast water standards for these organisms should be no less stringent than those standards for water used for bathing. In addition, the United States supports a broader suite of indicator species to include those with a capacity for adverse effects on fisheries species or those affecting corals or macro-algae.

Viable

11 The current standard expresses the concentrations as a maximum number of 'viable' organisms. Use of this term is likely to complicate the ability to verify a ship's compliance with this standard. Rather than pursue a discussion of a definition of the term 'viable,' the United States suggests a simplification to substitute 'living organisms' for 'viable organisms' in the text. Presently the determination of whether organisms are alive or dead is more straightforward than the interpretation of a living organism as viable, or capable of reproducing.

Existing Systems

12 The United States supports the removal of the brackets and the retention of the text in Regulation D-4. Several countries currently have programmes to evaluate the shipboard performance of treatment technologies. This portion of the Convention provides support for these types of evaluation programmes and necessary technological developments as well as establishing the appropriate limitations in order to ensure that the objectives of the treaty are met.

Action requested of the Conference

13 The Conference is requested to consider the above proposals and take action as appropriate.

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ANNEX

Regulation D-2 *Ballast Water Performance Standard*

1 Ships conducting Ballast Water Management in accordance with this Regulation shall discharge less than ~~[1][100] viable~~ **0.01 living** organism~~[s]~~ per cubic metre greater than ~~[~~50~~]/[~~80~~]~~ µm in size and less than ~~[1][10][100] viable~~ **0.01 living** organism~~[s]~~ per ml smaller than ~~[~~50~~]/[~~80~~]~~ µm and greater than 10 µm in size; and discharge of the indicator microbes described in paragraph 2 shall not exceed specified concentrations.

2 Indicator microbes~~, as a human health standard,~~ shall include, but should not be limited to:

.1 Toxigenic Vibrio cholera (01 and 0139) with <1 cfu per 100 ml (cfu = colony forming unit)
- <1 cfu per 1 g of zooplankton samples (wet weight)

.2 Escherichia coli ~~[250][500]~~**126** cfu per 100 ml

.3 Intestinal Enterococci ~~[100][200]~~**33** cfu per 100 ml